

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently Amended) A process for producing synthetic quartz glass, comprising: ~~the steps of~~ feeding oxygen gas, hydrogen gas, and a silica-forming reactant gas from a burner to a reaction zone, flame hydrolyzing the silica-forming reactant gas in the reaction zone to form fine particles of silica, depositing the silica particles on a rotatable substrate in the reaction zone to form a porous silica matrix wherein during formation of the porous silica matrix, the silica matrix and the flame of reactant gas from the burner are oriented to define an angle of 90° to 110° between their respective center axes so that the porous silica matrix has a density of 0.1 to 1.0 g/cm<sup>3</sup> with its distribution within 0.1 g/cm<sup>3</sup>, and heating and vitrifying the porous silica matrix in a fluorine compound gas-containing atmosphere to form a fluorine-containing synthetic quartz glass, ~~characterized in that~~

~~during formation of the porous silica matrix, the silica matrix and the flame of reactant gas from the burner are oriented to define an angle of 90 to 120° between their respective center axes so that the porous silica matrix has a density of 0.1 to 1.0 g/cm<sup>3</sup> with its distribution within 0.1 g/cm<sup>3</sup>.~~

2. (Original) The process of claim 1 wherein a fluorine compound gas is also fed from the burner to the reaction zone along with the silica-forming reactant gas.

3. (Currently Amended) The process of claim 1, further comprising ~~the step of~~ heat treating the fluorine-containing synthetic quartz glass in a hydrogen gas-containing atmosphere.

4. Withdrawn

5. Withdrawn

6. Withdrawn

Please add the following claims:

- 7. (New) A process according to claim 1, wherein the silica-forming reactant gas is silicon tetrachloride or an alkoxysilane.
8. (New) A process according to claim 8, wherein the alkoxysilane is tetramethoxysilane.
9. (New) A process according to claim 2, wherein the fluorine compound is SiF<sub>4</sub>, CHF<sub>3</sub>, or CF<sub>4</sub>.
10. (New) A process according to claim 1, wherein the fluorine compound gas containing atmosphere comprises a fluorine compound gas and an inert gas.
11. (New) A process according to claim 10, wherein the inert gas is helium or argon.
12. (New) A process according to claim 3, wherein the hydrogen gas-containing atmosphere comprises helium or argon.
13. (New) A process according to claim 3, wherein the hydrogen gas-containing atmosphere comprises 1-3% by volume hydrogen.
14. (New) A process for producing synthetic quartz glass, comprising:  
forming a porous silica matrix by orientating the porous silica matrix and a flame of a reactant gas from a burner to define an angle of 90° to 110° between their respective center axes so that the porous silica matrix has a density of 0.1 to 1.0 g/cm<sup>3</sup> with its distribution within 0.1 g/cm<sup>3</sup>.
15. (New) A process for producing synthetic quartz glass, wherein the porous silica matrix has a cylindrical form.--